

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 4-T2N-R65W

Reigle 28N-4HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services Proposal Report

16 August, 2012

Well Coordinates: 1,302,961.05 N, 3,232,555.74 E (40° 09' 43.30" N, 104° 40' 04.48" W)

Ground Level: 4,858.00 ft

Local Coordinate Origin:

Centered on Well Reigle 28N-4HZ

Viewing Datum:

RKB=16 @ 4874.00ft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 4-T2N-R65W
 Well: Reigle 28N-4HZ
 Wellbore: Plan A Rev 0
 Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.

HALLIBURTON
 Sperry Drilling

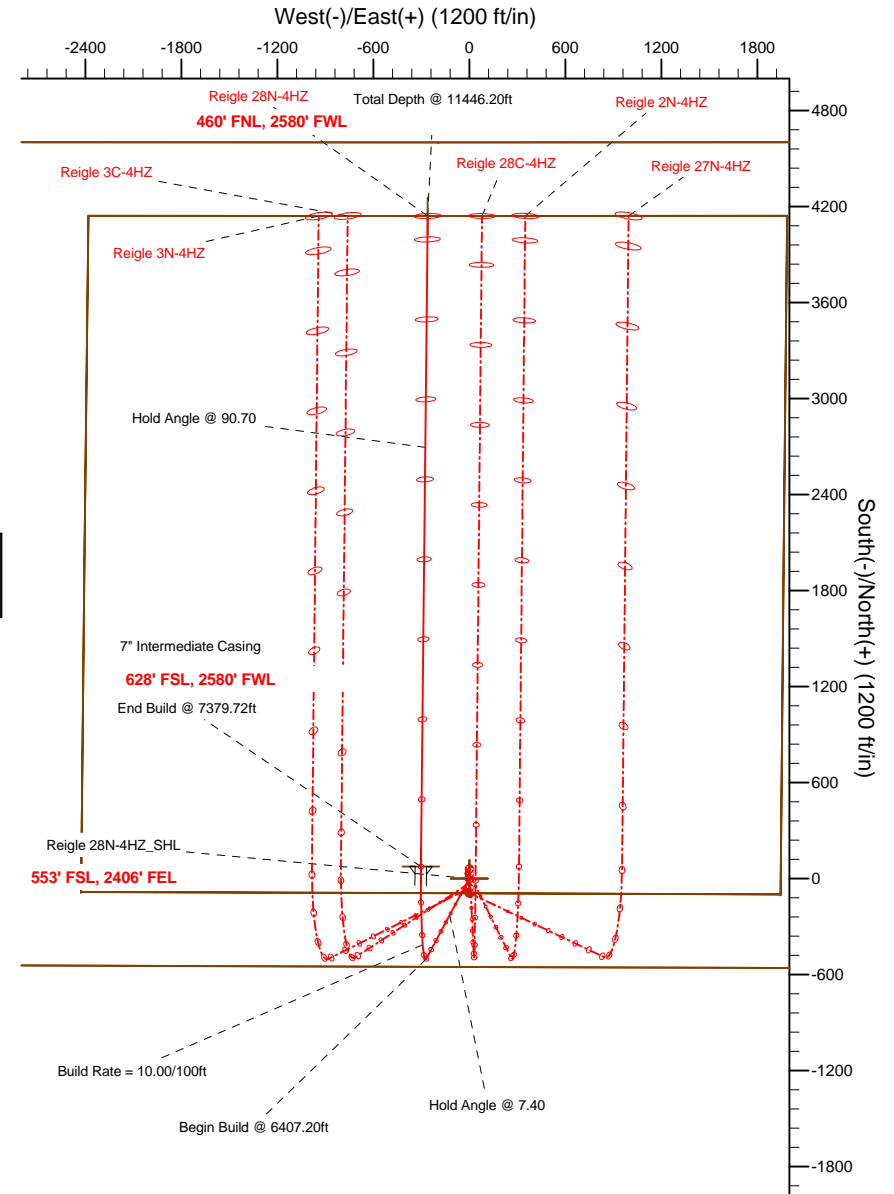
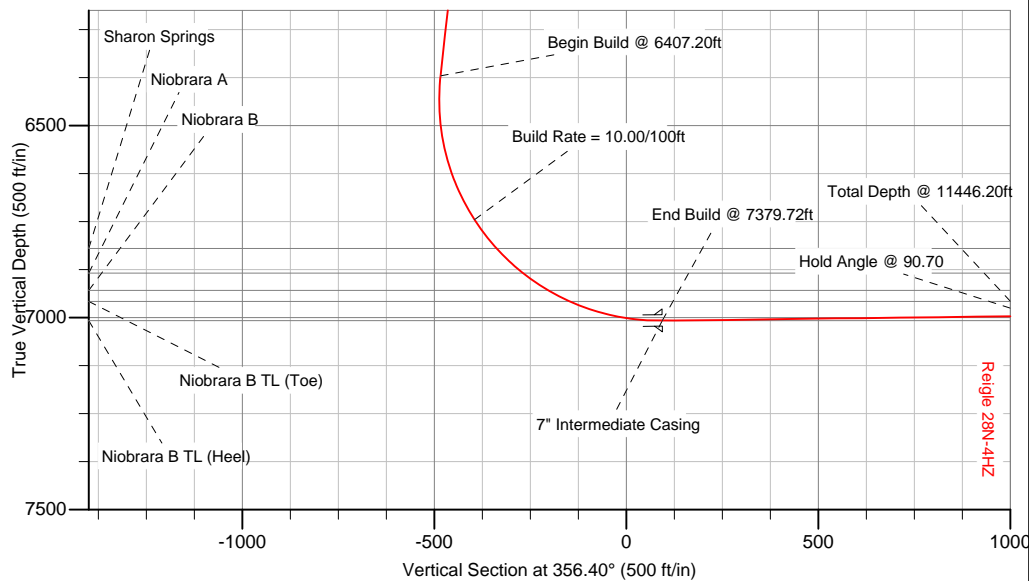
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1800.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.00	0.00	
3	2169.76	7.40	208.21	2168.74	-21.00	-11.27	2.00	208.21	-20.25	
4	6407.20	7.40	208.21	6370.93	-501.62	-269.11	0.00	0.00	-483.76	
5	7379.72	90.70	0.59	7008.00	75.00	-302.00	10.00	152.14	93.79	Reigle 28N-4HZ_Casing Point
6	11446.20	90.70	0.59	6958.00	4140.96	-260.17	0.00	0.00	4149.13	Reigle 28N-4HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Reigle 28N-4HZ_Section Lines	0.00	0.00	0.00	40.162028	-104.667910	Polygon
Reigle 28N-4HZ_Setback Lines	0.00	0.00	0.00	40.162028	-104.667910	Polygon
Reigle 28N-4HZ_SHL	0.00	0.00	0.00	40.162028	-104.667910	Point
Reigle 28N-4HZ_BHL	6958.00	4140.96	-260.17	40.173395	-104.668841	Point
Reigle 28N-4HZ_Casing Point	7008.00	75.00	-302.00	40.162234	-104.668991	Point

Target Line:
7008.69' TVDkb @ 0° VS Drilling 90.70°



WELL DETAILS: Reigle 28N-4HZ

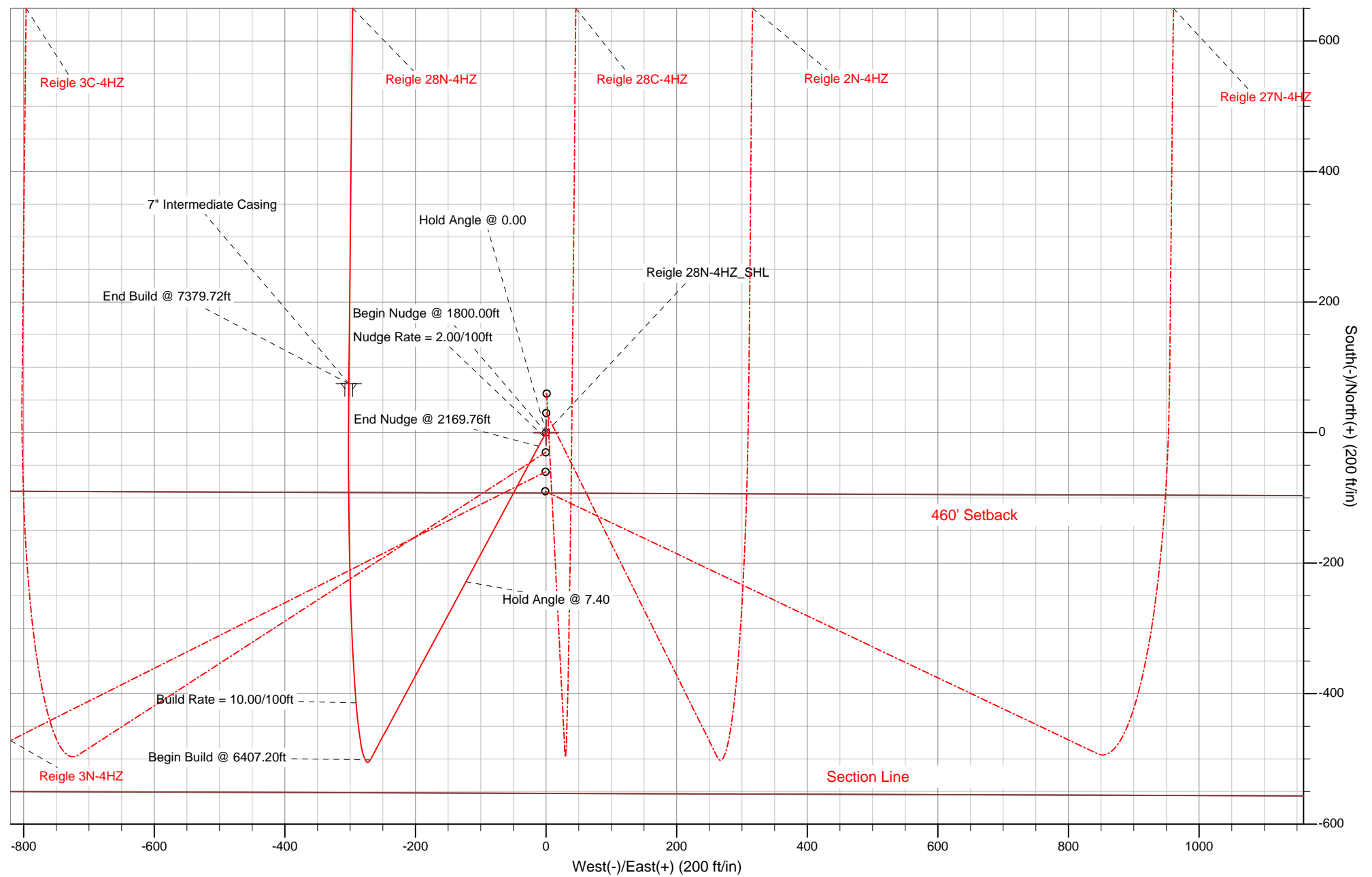
Ground Level: 4858.00 RKB=16 @ 4874.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Reigle 28N-4HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 08/02/2012
 Reviewed: _____ Date: _____

Project: Weld County, CO (NAD 83)
Site: Sec. 4-T2N-R65W
Well: Reigle 28N-4HZ
Wellbore: Plan A Rev 0
Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.



Plan Report for Reigle 28N-4HZ - Plan A Rev 0 Permit

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Reigle 28N-4HZ_SHL - Reigle 28N-4HZ_Section Lines - Reigle 28N-4HZ_Setback Lines										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hold Angle @ 0.00										
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1800.00ft										
1,900.00	2.00	208.21	1,899.98	-1.54	-0.83	-1.48	2.00	2.00	0.00	208.21
2,000.00	4.00	208.21	1,999.84	-6.15	-3.30	-5.93	2.00	2.00	0.00	0.00
Nudge Rate = 2.00/100ft										
2,100.00	6.00	208.21	2,099.45	-13.83	-7.42	-13.34	2.00	2.00	0.00	0.00
2,169.76	7.40	208.21	2,168.73	-21.00	-11.27	-20.25	2.00	2.00	0.00	0.00
End Nudge @ 2169.76ft										
2,200.00	7.40	208.21	2,198.72	-24.43	-13.11	-23.56	0.00	0.00	0.00	0.00
2,300.00	7.40	208.21	2,297.89	-35.77	-19.19	-34.50	0.00	0.00	0.00	0.00
2,400.00	7.40	208.21	2,397.06	-47.11	-25.28	-45.44	0.00	0.00	0.00	0.00
2,500.00	7.40	208.21	2,496.23	-58.46	-31.36	-56.37	0.00	0.00	0.00	0.00
2,600.00	7.40	208.21	2,595.40	-69.80	-37.45	-67.31	0.00	0.00	0.00	0.00
2,700.00	7.40	208.21	2,694.56	-81.14	-43.53	-78.25	0.00	0.00	0.00	0.00
2,800.00	7.40	208.21	2,793.73	-92.48	-49.61	-89.19	0.00	0.00	0.00	0.00
2,900.00	7.40	208.21	2,892.90	-103.82	-55.70	-100.13	0.00	0.00	0.00	0.00
3,000.00	7.40	208.21	2,992.07	-115.17	-61.78	-111.07	0.00	0.00	0.00	0.00
3,100.00	7.40	208.21	3,091.24	-126.51	-67.87	-122.00	0.00	0.00	0.00	0.00
3,200.00	7.40	208.21	3,190.40	-137.85	-73.95	-132.94	0.00	0.00	0.00	0.00
3,300.00	7.40	208.21	3,289.57	-149.19	-80.04	-143.88	0.00	0.00	0.00	0.00
3,400.00	7.40	208.21	3,388.74	-160.54	-86.12	-154.82	0.00	0.00	0.00	0.00
3,500.00	7.40	208.21	3,487.91	-171.88	-92.21	-165.76	0.00	0.00	0.00	0.00
3,600.00	7.40	208.21	3,587.08	-183.22	-98.29	-176.70	0.00	0.00	0.00	0.00
3,700.00	7.40	208.21	3,686.25	-194.56	-104.38	-187.63	0.00	0.00	0.00	0.00
3,800.00	7.40	208.21	3,785.41	-205.90	-110.46	-198.57	0.00	0.00	0.00	0.00
3,859.08	7.40	208.21	3,844.00	-212.61	-114.06	-205.04	0.00	0.00	0.00	0.00
Parkman										
3,900.00	7.40	208.21	3,884.58	-217.25	-116.55	-209.51	0.00	0.00	0.00	0.00
4,000.00	7.40	208.21	3,983.75	-228.59	-122.63	-220.45	0.00	0.00	0.00	0.00
Hold Angle @ 7.40										
4,100.00	7.40	208.21	4,082.92	-239.93	-128.72	-231.39	0.00	0.00	0.00	0.00
4,200.00	7.40	208.21	4,182.09	-251.27	-134.80	-242.33	0.00	0.00	0.00	0.00
4,300.00	7.40	208.21	4,281.25	-262.62	-140.89	-253.26	0.00	0.00	0.00	0.00
4,400.00	7.40	208.21	4,380.42	-273.96	-146.97	-264.20	0.00	0.00	0.00	0.00
4,455.04	7.40	208.21	4,435.00	-280.20	-150.32	-270.22	0.00	0.00	0.00	0.00
Sussex										
4,500.00	7.40	208.21	4,479.59	-285.30	-153.06	-275.14	0.00	0.00	0.00	0.00
4,600.00	7.40	208.21	4,578.76	-296.64	-159.14	-286.08	0.00	0.00	0.00	0.00

Plan Report for Reigle 28N-4HZ - Plan A Rev 0 Permit

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
4,700.00	7.40	208.21	4,677.93	-307.99	-165.23	-297.02	0.00	0.00	0.00	0.00
4,800.00	7.40	208.21	4,777.10	-319.33	-171.31	-307.96	0.00	0.00	0.00	0.00
4,900.00	7.40	208.21	4,876.26	-330.67	-177.40	-318.90	0.00	0.00	0.00	0.00
5,000.00	7.40	208.21	4,975.43	-342.01	-183.48	-329.83	0.00	0.00	0.00	0.00
5,100.00	7.40	208.21	5,074.60	-353.35	-189.57	-340.77	0.00	0.00	0.00	0.00
5,200.00	7.40	208.21	5,173.77	-364.70	-195.65	-351.71	0.00	0.00	0.00	0.00
5,300.00	7.40	208.21	5,272.94	-376.04	-201.74	-362.65	0.00	0.00	0.00	0.00
5,400.00	7.40	208.21	5,372.10	-387.38	-207.82	-373.59	0.00	0.00	0.00	0.00
5,500.00	7.40	208.21	5,471.27	-398.72	-213.91	-384.53	0.00	0.00	0.00	0.00
5,600.00	7.40	208.21	5,570.44	-410.07	-219.99	-395.46	0.00	0.00	0.00	0.00
5,700.00	7.40	208.21	5,669.61	-421.41	-226.08	-406.40	0.00	0.00	0.00	0.00
5,800.00	7.40	208.21	5,768.78	-432.75	-232.16	-417.34	0.00	0.00	0.00	0.00
5,900.00	7.40	208.21	5,867.95	-444.09	-238.25	-428.28	0.00	0.00	0.00	0.00
6,000.00	7.40	208.21	5,967.11	-455.43	-244.33	-439.22	0.00	0.00	0.00	0.00
6,100.00	7.40	208.21	6,066.28	-466.78	-250.42	-450.16	0.00	0.00	0.00	0.00
6,200.00	7.40	208.21	6,165.45	-478.12	-256.50	-461.09	0.00	0.00	0.00	0.00
6,300.00	7.40	208.21	6,264.62	-489.46	-262.59	-472.03	0.00	0.00	0.00	0.00
6,400.00	7.40	208.21	6,363.79	-500.80	-268.67	-482.97	0.00	0.00	0.00	0.00
6,407.20	7.40	208.21	6,370.93	-501.62	-269.11	-483.76	0.00	0.00	0.00	0.00
Begin Build @ 6407.20ft										
6,500.00	4.40	308.99	6,463.41	-504.65	-274.71	-486.43	10.00	-3.23	108.60	152.14
6,600.00	13.19	345.64	6,562.19	-491.15	-280.54	-472.60	10.00	8.79	36.65	51.64
6,700.00	22.98	352.38	6,657.15	-460.68	-285.97	-441.84	10.00	9.80	6.74	15.29
6,800.00	32.90	355.20	6,745.38	-414.15	-290.84	-395.10	10.00	9.91	2.82	8.86
Build Rate = 10.00/100ft										
6,894.26	42.27	356.75	6,820.00	-356.86	-294.79	-337.68	10.00	9.95	1.64	6.36
Sharon Springs										
6,900.00	42.85	356.82	6,824.23	-352.99	-295.01	-333.79	10.00	9.96	1.32	5.13
6,988.12	51.63	357.81	6,884.00	-288.42	-298.00	-269.17	10.00	9.97	1.12	5.08
Niobrara A										
7,000.00	52.81	357.93	6,891.28	-279.04	-298.35	-259.79	10.00	9.97	0.96	4.40
7,067.84	59.58	358.52	6,929.00	-222.73	-300.08	-203.47	10.00	9.97	0.87	4.33
Niobrara B										
7,100.00	62.79	358.77	6,944.50	-194.56	-300.75	-175.32	10.00	9.98	0.78	4.00
7,200.00	72.77	359.48	6,982.27	-102.12	-302.14	-82.97	10.00	9.98	0.70	3.88
7,300.00	82.75	0.11	7,003.45	-4.52	-302.48	14.46	10.00	9.98	0.63	3.61
7,379.72	90.70	0.59	7,008.00	75.00	-302.00	93.79	10.00	9.98	0.60	3.48
End Build @ 7379.72ft - Niobrara B TL (Heel) - 7" Intermediate Casing - Reigle 28N-4HZ_Casing Point										
7,400.00	90.70	0.59	7,007.75	95.28	-301.79	114.02	0.00	0.00	0.00	3.45
7,500.00	90.70	0.59	7,006.52	195.27	-300.76	213.74	0.00	0.00	0.00	0.00
7,600.00	90.70	0.59	7,005.29	295.26	-299.73	313.47	0.00	0.00	0.00	0.00
7,700.00	90.70	0.59	7,004.06	395.24	-298.71	413.20	0.00	0.00	0.00	0.00
7,800.00	90.70	0.59	7,002.83	495.23	-297.68	512.92	0.00	0.00	0.00	0.00
7,900.00	90.70	0.59	7,001.60	595.22	-296.65	612.65	0.00	0.00	0.00	0.00
8,000.00	90.70	0.59	7,000.37	695.20	-295.62	712.37	0.00	0.00	0.00	0.00
8,100.00	90.70	0.59	6,999.14	795.19	-294.59	812.10	0.00	0.00	0.00	0.00
8,200.00	90.70	0.59	6,997.91	895.18	-293.56	911.83	0.00	0.00	0.00	0.00
8,300.00	90.70	0.59	6,996.68	995.17	-292.53	1,011.55	0.00	0.00	0.00	0.00
8,400.00	90.70	0.59	6,995.45	1,095.15	-291.51	1,111.28	0.00	0.00	0.00	0.00
8,500.00	90.70	0.59	6,994.23	1,195.14	-290.48	1,211.00	0.00	0.00	0.00	0.00
8,600.00	90.70	0.59	6,993.00	1,295.13	-289.45	1,310.73	0.00	0.00	0.00	0.00
8,700.00	90.70	0.59	6,991.77	1,395.11	-288.42	1,410.45	0.00	0.00	0.00	0.00
8,800.00	90.70	0.59	6,990.54	1,495.10	-287.39	1,510.18	0.00	0.00	0.00	0.00
8,900.00	90.70	0.59	6,989.31	1,595.09	-286.36	1,609.91	0.00	0.00	0.00	0.00
9,000.00	90.70	0.59	6,988.08	1,695.08	-285.33	1,709.63	0.00	0.00	0.00	0.00
9,100.00	90.70	0.59	6,986.85	1,795.06	-284.30	1,809.36	0.00	0.00	0.00	0.00
9,200.00	90.70	0.59	6,985.62	1,895.05	-283.28	1,909.08	0.00	0.00	0.00	0.00
9,300.00	90.70	0.59	6,984.39	1,995.04	-282.25	2,008.81	0.00	0.00	0.00	0.00
9,400.00	90.70	0.59	6,983.16	2,095.02	-281.22	2,108.54	0.00	0.00	0.00	0.00

Plan Report for Reigle 28N-4HZ - Plan A Rev 0 Permit

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
9,500.00	90.70	0.59	6,981.93	2,195.01	-280.19	2,208.26	0.00	0.00	0.00	0.00
9,600.00	90.70	0.59	6,980.70	2,295.00	-279.16	2,307.99	0.00	0.00	0.00	0.00
9,700.00	90.70	0.59	6,979.47	2,394.99	-278.13	2,407.71	0.00	0.00	0.00	0.00
9,800.00	90.70	0.59	6,978.24	2,494.97	-277.10	2,507.44	0.00	0.00	0.00	0.00
9,900.00	90.70	0.59	6,977.01	2,594.96	-276.08	2,607.17	0.00	0.00	0.00	0.00
10,000.00	90.70	0.59	6,975.78	2,694.95	-275.05	2,706.89	0.00	0.00	0.00	0.00
Hold Angle @ 90.70										
10,100.00	90.70	0.59	6,974.55	2,794.93	-274.02	2,806.62	0.00	0.00	0.00	0.00
10,200.00	90.70	0.59	6,973.32	2,894.92	-272.99	2,906.34	0.00	0.00	0.00	0.00
10,300.00	90.70	0.59	6,972.09	2,994.91	-271.96	3,006.07	0.00	0.00	0.00	0.00
10,400.00	90.70	0.59	6,970.86	3,094.90	-270.93	3,105.79	0.00	0.00	0.00	0.00
10,500.00	90.70	0.59	6,969.63	3,194.88	-269.90	3,205.52	0.00	0.00	0.00	0.00
10,600.00	90.70	0.59	6,968.40	3,294.87	-268.88	3,305.25	0.00	0.00	0.00	0.00
10,700.00	90.70	0.59	6,967.17	3,394.86	-267.85	3,404.97	0.00	0.00	0.00	0.00
10,800.00	90.70	0.59	6,965.95	3,494.84	-266.82	3,504.70	0.00	0.00	0.00	0.00
10,900.00	90.70	0.59	6,964.72	3,594.83	-265.79	3,604.42	0.00	0.00	0.00	0.00
11,000.00	90.70	0.59	6,963.49	3,694.82	-264.76	3,704.15	0.00	0.00	0.00	0.00
11,100.00	90.70	0.59	6,962.26	3,794.81	-263.73	3,803.88	0.00	0.00	0.00	0.00
11,200.00	90.70	0.59	6,961.03	3,894.79	-262.70	3,903.60	0.00	0.00	0.00	0.00
11,300.00	90.70	0.59	6,959.80	3,994.78	-261.67	4,003.33	0.00	0.00	0.00	0.00
11,400.00	90.70	0.59	6,958.57	4,094.77	-260.65	4,103.05	0.00	0.00	0.00	0.00
11,446.19	90.70	0.59	6,958.00	4,140.95	-260.17	4,149.12	0.00	0.00	0.00	0.00
Niobrara B TL (Toe)										
11,446.20	90.70	0.59	6,958.00	4,140.96	-260.17	4,149.13	0.00	0.00	0.00	0.00
Reigle 28N-4HZ_BHL										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
900.00	900.00	0.00	0.00	Hold Angle @ 0.00
1,800.00	1,800.00	0.00	0.00	Begin Nudge @ 1800.00ft
2,000.00	1,999.84	-6.15	-3.30	Nudge Rate = 2.00/100ft
2,169.76	2,168.73	-21.00	-11.27	End Nudge @ 2169.76ft
4,000.00	3,983.75	-228.59	-122.63	Hold Angle @ 7.40
6,407.20	6,370.93	-501.62	-269.11	Begin Build @ 6407.20ft
6,800.00	6,745.38	-414.15	-290.84	Build Rate = 10.00/100ft
7,379.72	7,008.00	75.00	-302.00	End Build @ 7379.72ft
10,000.00	6,975.78	2,694.95	-275.05	Hold Angle @ 90.70
11,446.20	6,958.00	4,140.96	-260.17	Total Depth @ 11446.20ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Reigle 28N-4HZ_BHL	356.40	Slot	0.00	0.00	6,958.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	11,446.20	Plan A Rev 0 Permit	MWD

Plan Report for Reigle 28N-4HZ - Plan A Rev 0 Permit**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,379.72	7,008.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,859.08	3,844.00	Parkman		0.00	
4,455.04	4,435.00	Sussex		0.00	
6,894.26	6,820.00	Sharon Springs		0.00	
6,988.12	6,884.00	Niobrara A		0.00	
7,067.84	6,929.00	Niobrara B		0.00	
7,379.72	7,008.00	Niobrara B TL (Heel)		0.00	
11,446.19	6,958.00	Niobrara B TL (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Reigle 28N-4HZ_Setback Lines	0.00	0.00	0.00	Point
Reigle 28N-4HZ_SHL	0.00	0.00	0.00	Point
Reigle 28N-4HZ_BHL	6,958.00	4,140.96	-260.17	Point
Reigle 28N-4HZ_Section Lines	0.00	0.00	0.00	Point
Reigle 28N-4HZ_Casing Point	7,008.00	75.00	-302.00	Point

North Reference Sheet for Sec. 4-T2N-R65W - Reigle 28N-4HZ - Plan A Rev 0

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB=16 @ 4874.00ft (Drilling Rig). Northing and Easting are relative to Reigle 28N-4HZ

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.000644ft, False Northing: 1,000,000.001308ft, Scale Reduction: 0.99995804

Grid Coordinates of Well: 1,302,961.054941 ft N, 3,232,555.739083 ft E

Geographical Coordinates of Well: 40° 09' 43.30" N, 104° 40' 04.48" W

Grid Convergence at Surface is: 0.54°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,446.20ft
the Bottom Hole Displacement is 4,149.13ft in the Direction of 356.40° (True).

Magnetic Convergence at surface is: -8.09° (16 August 2012, , BGGM2011)

